

TABLE I.—HIRF ENVIRONMENT I

Frequency	Field strength (volts/meter)	
	Peak	Average
10 kHz–2 MHz	50	50
2 MHz–30 MHz	100	100
30 MHz–100 MHz	50	50
100 MHz–400 MHz	100	100
400 MHz–700 MHz	700	50
700 MHz–1 GHz	700	100
GHz–2 GHz	2,000	200
2 GHz–6 GHz	3,000	200
6 GHz–8 GHz	1,000	200
8 GHz–12 GHz	3,000	300
12 GHz–18 GHz	2,000	200
18 GHz–40 GHz	600	200

In this table, the higher field strength applies at the frequency band edges.

(b) HIRF environment II is specified in the following table:

TABLE II.—HIRF ENVIRONMENT II

Frequency	Field strength (volts/meter)	
	Peak	Average
10 kHz–500 kHz	20	20
500 kHz–2 MHz	30	30
2 MHz–30 MHz	100	100
30 MHz–100 MHz	10	10
100 MHz–200 MHz	30	10
200 MHz–400 MHz	10	10
400 MHz–1 GHz	700	40
1 GHz–2 GHz	1,300	160
2 GHz–4 GHz	3,000	120
4 GHz–6 GHz	3,000	160
6 GHz–8 GHz	400	170
8 GHz–12 GHz	1,230	230
12 GHz–18 GHz	730	190
18 GHz–40 GHz	600	150

In this table, the higher field strength applies at the frequency band edges.

(c) *Equipment HIRF Test Level 1.*

(1) From 10 kilohertz (kHz) to 400 megahertz (MHz), use conducted susceptibility tests with continuous wave (CW) and 1 kHz square wave modulation with 90 percent depth or greater. The conducted susceptibility current must start at a minimum of 0.6 milliamperes (mA) at 10 kHz, increasing 20 decibels (dB) per frequency decade to a minimum of 30 mA at 500 kHz.

(2) From 500 kHz to 40 MHz, the conducted susceptibility current must be at least 30 mA.

(3) From 40 MHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 30 mA at 40 MHz, decreasing 20 dB per frequency decade to a minimum of 3 mA at 400 MHz.

(4) From 100 MHz to 400 MHz, use radiated susceptibility tests at a minimum of 20 volts per meter (V/m) peak with CW and 1 kHz square wave modulation with 90 percent depth or greater.

(5) From 400 MHz to 8 gigahertz (GHz), use radiated susceptibility tests at a minimum of 150 V/m peak with pulse modulation of 4 percent duty cycle with a 1 kHz pulse repetition frequency. This signal must be switched on and off at a rate of 1 Hz with a duty cycle of 50 percent.

(d) *Equipment HIRF Test Level 2.* Equipment HIRF test level 2 is HIRF environment II in table II of this appendix reduced by acceptable aircraft transfer function and attenuation curves. Testing must cover the frequency band of 10 kHz to 8 GHz.

(e) *Equipment HIRF Test Level 3.*

(1) From 10 kHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 0.15 mA at 10 kHz, increasing 20 dB per frequency decade to a minimum of 7.5 mA at 500 kHz.

(2) From 500 kHz to 40 MHz, use conducted susceptibility tests at a minimum of 7.5 mA.

(3) From 40 MHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 7.5 mA at 40 MHz, decreasing 20 dB per frequency decade to a minimum of 0.75 mA at 400 MHz.

(4) From 100 MHz to 8 GHz, use radiated susceptibility tests at a minimum of 5 V/m.

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PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

SPECIAL FEDERAL AVIATION REGULATION NO. 13

Subpart A—General

Sec.

25.1 Applicability.

25.2 Special retroactive requirements.

25.3 Special provisions for ETOPS type design approvals.

Subpart B—Flight

GENERAL

25.21 Proof of compliance.

25.23 Load distribution limits.

25.25 Weight limits.

25.27 Center of gravity limits.

25.29 Empty weight and corresponding center of gravity.

25.31 Removable ballast.

25.33 Propeller speed and pitch limits.

PERFORMANCE

25.101 General.

25.103 Stall speed.

25.105 Takeoff.

25.107 Takeoff speeds.

25.109 Accelerate-stop distance.

25.111 Takeoff path.

Federal Aviation Administration, DOT

Pt. 25

- 25.113 Takeoff distance and takeoff run.
- 25.115 Takeoff flight path.
- 25.117 Climb: general.
- 25.119 Landing climb: All-engines-operating.
- 25.121 Climb: One-engine-inoperative.
- 25.123 En route flight paths.
- 25.125 Landing.

CONTROLLABILITY AND MANEUVERABILITY

- 25.143 General.
- 25.145 Longitudinal control.
- 25.147 Directional and lateral control.
- 25.149 Minimum control speed.

TRIM

- 25.161 Trim.

STABILITY

- 25.171 General.
- 25.173 Static longitudinal stability.
- 25.175 Demonstration of static longitudinal stability.
- 25.177 Static lateral-directional stability.
- 25.181 Dynamic stability.

STALLS

- 25.201 Stall demonstration.
- 25.203 Stall characteristics.
- 25.207 Stall warning.

GROUND AND WATER HANDLING CHARACTERISTICS

- 25.231 Longitudinal stability and control.
- 25.233 Directional stability and control.
- 25.235 Taxiing condition.
- 25.237 Wind velocities.
- 25.239 Spray characteristics, control, and stability on water.

MISCELLANEOUS FLIGHT REQUIREMENTS

- 25.251 Vibration and buffeting.
- 25.253 High-speed characteristics.
- 25.255 Out-of-trim characteristics.

Subpart C—Structure

GENERAL

- 25.301 Loads.
- 25.303 Factor of safety.
- 25.305 Strength and deformation.
- 25.307 Proof of structure.

FLIGHT LOADS

- 25.321 General.

FLIGHT MANEUVER AND GUST CONDITIONS

- 25.331 Symmetric maneuvering conditions.
- 25.333 Flight maneuvering envelope.
- 25.335 Design airspeeds.
- 25.337 Limit maneuvering load factors.
- 25.341 Gust and turbulence loads.
- 25.343 Design fuel and oil loads.
- 25.345 High lift devices.
- 25.349 Rolling conditions.
- 25.351 Yaw maneuver conditions.

SUPPLEMENTARY CONDITIONS

- 25.361 Engine torque.
- 25.363 Side load on engine and auxiliary power unit mounts.
- 25.365 Pressurized compartment loads.
- 25.367 Unsymmetrical loads due to engine failure.
- 25.371 Gyroscopic loads.
- 25.373 Speed control devices.

CONTROL SURFACE AND SYSTEM LOADS

- 25.391 Control surface loads: General.
- 25.393 Loads parallel to hinge line.
- 25.395 Control system.
- 25.397 Control system loads.
- 25.399 Dual control system.
- 25.405 Secondary control system.
- 25.407 Trim tab effects.
- 25.409 Tabs.
- 25.415 Ground gust conditions.
- 25.427 Unsymmetrical loads.
- 25.445 Auxilliary aerodynamic surfaces.
- 25.457 Wing flaps.
- 25.459 Special devices.

GROUND LOADS

- 25.471 General.
- 25.473 Landing load conditions and assumptions.
- 25.477 Landing gear arrangement.
- 25.479 Level landing conditions.
- 25.481 Tail-down landing conditions.
- 25.483 One-gear landing conditions.
- 25.485 Side load conditions.
- 25.487 Rebound landing condition.
- 25.489 Ground handling conditions.
- 25.491 Taxi, takeoff and landing roll.
- 25.493 Braked roll conditions.
- 25.495 Turning.
- 25.497 Tail-wheel yawing.
- 25.499 Nose-wheel yaw and steering.
- 25.503 Pivoting.
- 25.507 Reversed braking.
- 25.509 Towing loads.
- 25.511 Ground load: unsymmetrical loads on multiple-wheel units.
- 25.519 Jacking and tie-down provisions.

WATER LOADS

- 25.521 General.
- 25.523 Design weights and center of gravity positions.
- 25.525 Application of loads.
- 25.527 Hull and main float load factors.
- 25.529 Hull and main float landing conditions.
- 25.531 Hull and main float takeoff condition.
- 25.533 Hull and main float bottom pressures.
- 25.535 Auxiliary float loads.
- 25.537 Seawing loads.

EMERGENCY LANDING CONDITIONS

- 25.561 General.
- 25.562 Emergency landing dynamic conditions.

Pt. 25**14 CFR Ch. I (1–1–08 Edition)**

25.563 Structural ditching provisions.

FATIGUE EVALUATION

25.571 Damage—tolerance and fatigue evaluation of structure.

LIGHTNING PROTECTION

25.581 Lightning protection.

Subpart D—Design and Construction**GENERAL**

25.601 General.
25.603 Materials.
25.605 Fabrication methods.
25.607 Fasteners.
25.609 Protection of structure.
25.611 Accessibility provisions.
25.613 Material strength properties and material design values.
25.619 Special factors.
25.621 Casting factors.
25.623 Bearing factors.
25.625 Fitting factors.
25.629 Aeroelastic stability requirements.
25.631 Bird strike damage.

CONTROL SURFACES

25.651 Proof of strength.
25.655 Installation.
25.657 Hinges.

CONTROL SYSTEMS

25.671 General.
25.672 Stability augmentation and automatic and power-operated systems.
25.675 Stops.
25.677 Trim systems.
25.679 Control system gust locks.
25.681 Limit load static tests.
25.683 Operation tests.
25.685 Control system details.
25.689 Cable systems.
25.693 Joints.
25.697 Lift and drag devices, controls.
25.699 Lift and drag device indicator.
25.701 Flap and slat interconnection.
25.703 Takeoff warning system.

LANDING GEAR

25.721 General.
25.723 Shock absorption tests.
25.725–25.727 [Reserved]
25.729 Retracting mechanism.
25.731 Wheels.
25.733 Tires.
25.735 Brakes and braking systems.
25.737 Skis.

FLOATS AND HULLS

25.751 Main float buoyancy.
25.753 Main float design.
25.755 Hulls.

PERSONNEL AND CARGO ACCOMMODATIONS

25.771 Pilot compartment.
25.772 Pilot compartment doors.
25.773 Pilot compartment view.
25.775 Windshields and windows.
25.777 Cockpit controls.
25.779 Motion and effect of cockpit controls.
25.781 Cockpit control knob shape.
25.783 Fuselage doors.
25.785 Seats, berths, safety belts, and harnesses.
25.787 Stowage compartments.
25.789 Retention of items of mass in passenger and crew compartments and galleys.
25.791 Passenger information signs and placards.
25.793 Floor surfaces.
25.795 Security considerations.

EMERGENCY PROVISIONS

25.801 Ditching.
25.803 Emergency evacuation.
25.807 Emergency exits.
25.809 Emergency exit arrangement.
25.810 Emergency egress assist means and escape routes.
25.811 Emergency exit marking.
25.812 Emergency lighting.
25.813 Emergency exit access.
25.815 Width of aisle.
25.817 Maximum number of seats abreast.
25.819 Lower deck service compartments (including galleys).
25.820 Lavatory doors.

VENTILATION AND HEATING

25.831 Ventilation.
25.832 Cabin ozone concentration.
25.833 Combustion heating systems.

PRESSURIZATION

25.841 Pressurized cabins.
25.843 Tests for pressurized cabins.

FIRE PROTECTION

25.851 Fire extinguishers.
25.853 Compartment interiors.
25.854 Lavatory fire protection.
25.855 Cargo or baggage compartments.
25.856 Thermal/Acoustic insulation materials.
25.857 Cargo compartment classification.
25.858 Cargo or baggage compartment smoke or fire detection systems.
25.859 Combustion heater fire protection.
25.863 Flammable fluid fire protection.
25.865 Fire protection of flight controls, engine mounts, and other flight structure.
25.867 Fire protection: other components.
25.869 Fire protection: systems.

MISCELLANEOUS

25.871 Leveling means.
25.875 Reinforcement near propellers.

25.899 Electrical bonding and protection against static electricity.

Subpart E—Powerplant

GENERAL

25.901 Installation.
 25.903 Engines.
 25.904 Automatic takeoff thrust control system (ATTCS).
 25.905 Propellers.
 25.907 Propeller vibration.
 25.925 Propeller clearance.
 25.929 Propeller deicing.
 25.933 Reversing systems.
 25.934 Turbojet engine thrust reverser system tests.
 25.937 Turbopropeller-drag limiting systems.
 25.939 Turbine engine operating characteristics.
 25.941 Inlet, engine, and exhaust compatibility.
 25.943 Negative acceleration.
 25.945 Thrust or power augmentation system.

FUEL SYSTEM

25.951 General.
 25.952 Fuel system analysis and test.
 25.953 Fuel system independence.
 25.954 Fuel system lightning protection.
 25.955 Fuel flow.
 25.957 Flow between interconnected tanks.
 25.959 Unusable fuel supply.
 25.961 Fuel system hot weather operation.
 25.963 Fuel tanks: general.
 25.965 Fuel tank tests.
 25.967 Fuel tank installations.
 25.969 Fuel tank expansion space.
 25.971 Fuel tank sump.
 25.973 Fuel tank filler connection.
 25.975 Fuel tank vents and carburetor vapor vents.
 25.977 Fuel tank outlet.
 25.979 Pressure fueling system.
 25.981 Fuel tank ignition prevention.

FUEL SYSTEM COMPONENTS

25.991 Fuel pumps.
 25.993 Fuel system lines and fittings.
 25.994 Fuel system components.
 25.995 Fuel valves.
 25.997 Fuel strainer or filter.
 25.999 Fuel system drains.
 25.1001 Fuel jettisoning system.

OIL SYSTEM

25.1011 General.
 25.1013 Oil tanks.
 25.1015 Oil tank tests.
 25.1017 Oil lines and fittings.
 25.1019 Oil strainer or filter.
 25.1021 Oil system drains.
 25.1023 Oil radiators.
 25.1025 Oil valves.

25.1027 Propeller feathering system.

COOLING

25.1041 General.
 25.1043 Cooling tests.
 25.1045 Cooling test procedures.

INDUCTION SYSTEM

25.1091 Air induction.
 25.1093 Induction system icing protection.
 25.1101 Carburetor air preheater design.
 25.1103 Induction system ducts and air duct systems.
 25.1105 Induction system screens.
 25.1107 Inter-coolers and after-coolers.

EXHAUST SYSTEM

25.1121 General.
 25.1123 Exhaust piping.
 25.1125 Exhaust heat exchangers.
 25.1127 Exhaust driven turbo-superchargers.

POWERPLANT CONTROLS AND ACCESSORIES

25.1141 Powerplant controls: general.
 25.1142 Auxiliary power unit controls.
 25.1143 Engine controls.
 25.1145 Ignition switches.
 25.1147 Mixture controls.
 25.1149 Propeller speed and pitch controls.
 25.1153 Propeller feathering controls.
 25.1155 Reverse thrust and propeller pitch settings below the flight regime.
 25.1157 Carburetor air temperature controls.
 25.1159 Supercharger controls.
 25.1161 Fuel jettisoning system controls.
 25.1163 Powerplant accessories.
 25.1165 Engine ignition systems.
 25.1167 Accessory gearboxes.

POWERPLANT FIRE PROTECTION

25.1181 Designated fire zones; regions included.
 25.1182 Nacelle areas behind firewalls, and engine pod attaching structures containing flammable fluid lines.
 25.1183 Flammable fluid-carrying components.
 25.1185 Flammable fluids.
 25.1187 Drainage and ventilation of fire zones.
 25.1189 Shutoff means.
 25.1191 Firewalls.
 25.1192 Engine accessory section diaphragm.
 25.1193 Cowling and nacelle skin.
 25.1195 Fire extinguishing systems.
 25.1197 Fire extinguishing agents.
 25.1199 Extinguishing agent containers.
 25.1201 Fire extinguishing system materials.
 25.1203 Fire detector system.
 25.1207 Compliance.

Subpart F—Equipment

GENERAL

25.1301 Function and installation.

Pt. 25

- 25.1303 Flight and navigation instruments.
- 25.1305 Powerplant instruments.
- 25.1307 Miscellaneous equipment.
- 25.1309 Equipment, systems, and installations.
- 25.1310 Power source capacity and distribution.
- 25.1316 System lightning protection.
- 25.1317 High-intensity Radiated Fields (HIRF) Protection.

INSTRUMENTS: INSTALLATION

- 25.1321 Arrangement and visibility.
- 25.1322 Warning, caution, and advisory lights.
- 25.1323 Airspeed indicating system.
- 25.1325 Static pressure systems.
- 25.1326 Pitot heat indication systems.
- 25.1327 Magnetic direction indicator.
- 25.1329 Flight guidance system.
- 25.1331 Instruments using a power supply.
- 25.1333 Instrument systems.
- 25.1337 Powerplant instruments.

ELECTRICAL SYSTEMS AND EQUIPMENT

- 25.1351 General.
- 25.1353 Electrical equipment and installations.
- 25.1355 Distribution system.
- 25.1357 Circuit protective devices.
- 25.1360 Precautions against injury.
- 25.1362 Electrical supplies for emergency conditions.
- 25.1363 Electrical system tests.
- 25.1365 Electrical appliances, motors, and transformers.

LIGHTS

- 25.1381 Instrument lights.
- 25.1383 Landing lights.
- 25.1385 Position light system installation.
- 25.1387 Position light system dihedral angles.
- 25.1389 Position light distribution and intensities.
- 25.1391 Minimum intensities in the horizontal plane of forward and rear position lights.
- 25.1393 Minimum intensities in any vertical plane of forward and rear position lights.
- 25.1395 Maximum intensities in overlapping beams of forward and rear position lights.
- 25.1397 Color specifications.
- 25.1399 Riding light.
- 25.1401 Anticollision light system.
- 25.1403 Wing icing detection lights.

SAFETY EQUIPMENT

- 25.1411 General.
- 25.1415 Ditching equipment.
- 25.1419 Ice protection.
- 25.1421 Megaphones.
- 25.1423 Public address system.

14 CFR Ch. I (1–1–08 Edition)**MISCELLANEOUS EQUIPMENT**

- 25.1431 Electronic equipment.
- 25.1433 Vacuum systems.
- 25.1435 Hydraulic systems.
- 25.1438 Pressurization and pneumatic systems.
- 25.1439 Protective breathing equipment.
- 25.1441 Oxygen equipment and supply.
- 25.1443 Minimum mass flow of supplemental oxygen.
- 25.1445 Equipment standards for the oxygen distributing system.
- 25.1447 Equipment standards for oxygen dispensing units.
- 25.1449 Means for determining use of oxygen.
- 25.1450 Chemical oxygen generators.
- 25.1453 Protection of oxygen equipment from rupture.
- 25.1455 Draining of fluids subject to freezing.
- 25.1457 Cockpit voice recorders.
- 25.1459 Flight recorders.
- 25.1461 Equipment containing high energy rotors.

Subpart G—Operating Limitations and Information

- 25.1501 General.

OPERATING LIMITATIONS

- 25.1503 Airspeed limitations: general.
- 25.1505 Maximum operating limit speed.
- 25.1507 Maneuvering speed.
- 25.1511 Flap extended speed.
- 25.1513 Minimum control speed.
- 25.1515 Landing gear speeds.
- 25.1516 Other speed limitations.
- 25.1517 Rough air speed, V_{RA} .
- 25.1519 Weight, center of gravity, and weight distribution.
- 25.1521 Powerplant limitations.
- 25.1522 Auxiliary power unit limitations.
- 25.1523 Minimum flight crew.
- 25.1525 Kinds of operation.
- 25.1527 Ambient air temperature and operating altitude.
- 25.1529 Instructions for Continued Airworthiness.
- 25.1531 Maneuvering flight load factors.
- 25.1533 Additional operating limitations.
- 25.1535 ETOPS approval.

MARKINGS AND PLACARDS

- 25.1541 General.
- 25.1543 Instrument markings: general.
- 25.1545 Airspeed limitation information.
- 25.1547 Magnetic direction indicator.
- 25.1549 Powerplant and auxiliary power unit instruments.
- 25.1551 Oil quantity indication.
- 25.1553 Fuel quantity indicator.
- 25.1555 Control markings.
- 25.1557 Miscellaneous markings and placards.

Federal Aviation Administration, DOT

Pt. 25, SFAR No. 13

- 25.1561 Safety equipment.
- 25.1563 Airspeed placard.

AIRPLANE FLIGHT MANUAL

- 25.1581 General.
- 25.1583 Operating limitations.
- 25.1585 Operating procedures.
- 25.1587 Performance information.

Subpart H—Electrical Wiring
Interconnection Systems (EWIS)

- 25.1701 Definition.
- 25.1703 Function and installation: EWIS.
- 25.1705 Systems and functions: EWIS.
- 25.1707 System separation: EWIS.
- 25.1709 System safety: EWIS.
- 25.1711 Component identification: EWIS.
- 25.1713 Fire protection: EWIS.
- 25.1715 Electrical bonding and protection against static electricity: EWIS.
- 25.1717 Circuit protective devices: EWIS.
- 25.1719 Accessibility provisions: EWIS.
- 25.1721 Protection of EWIS.
- 25.1723 Flammable fluid fire protection: EWIS.
- 25.1725 Powerplants: EWIS.
- 25.1727 Flammable fluid shutoff means: EWIS.
- 25.1729 Instructions for Continued Airworthiness: EWIS.
- 25.1731 Powerplant and APU fire detector system: EWIS.
- 25.1733 Fire detector systems, general: EWIS.

APPENDIX A TO PART 25

APPENDIX B TO PART 25

APPENDIX C TO PART 25

APPENDIX D TO PART 25

APPENDIX E TO PART 25

APPENDIX F TO PART 25

APPENDIX G TO PART 25—CONTINUOUS GUST DESIGN CRITERIA

APPENDIX H TO PART 25—INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

APPENDIX I TO PART 25—INSTALLATION OF AN AUTOMATIC TAKEOFF THRUST CONTROL SYSTEM (ATTCS)

APPENDIX J TO PART 25—EMERGENCY EVACUATION

APPENDIX K TO PART 25—EXTENDED OPERATIONS (ETOPS)

APPENDIX L TO PART 25—HIRF ENVIRONMENTS AND EQUIPMENT HIRF TEST LEVELS

AUTHORITY: 49 U.S.C. 106(g), 40113, 44701, 44702 and 44704.

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SPECIAL FEDERAL AVIATION REGULATION
No. 13

1. *Applicability.* Contrary provisions of the Civil Air Regulations regarding certification

notwithstanding,¹ this regulation shall provide the basis for approval by the Administrator of modifications of individual Douglas DC-3 and Lockheed L-18 airplanes subsequent to the effective date of this regulation.

2. *General modifications.* Except as modified in sections 3 and 4 of this regulation, an applicant for approval of modifications to a DC-3 or L-18 airplane which result in changes in design or in changes to approved limitations shall show that the modifications were accomplished in accordance with the rules of either Part 4a or Part 4b in effect on September 1, 1953, which are applicable to the modification being made: *Provided*, That an applicant may elect to accomplish a modification in accordance with the rules of Part 4b in effect on the date of application for the modification in lieu of Part 4a or Part 4b as in effect on September 1, 1953: *And provided further*, That each specific modification must be accomplished in accordance with all of the provisions contained in the elected rules relating to the particular modification.

3. *Specific conditions for approval.* An applicant for any approval of the following specific changes shall comply with section 2 of this regulation as modified by the applicable provisions of this section.

(a) *Increase in take-off power limitation—1,200 to 1,350 horsepower.* The engine take-off power limitation for the airplane may be increased to more than 1,200 horsepower but not to more than 1,350 horsepower per engine if the increase in power does not adversely affect the flight characteristics of the airplane.

(b) *Increase in take-off power limitation to more than 1,350 horsepower.* The engine take-off power limitation for the airplane may be increased to more than 1,350 horsepower per engine if compliance is shown with the flight characteristics and ground handling requirements of Part 4b.

(c) *Installation of engines of not more than 1,830 cubic inches displacement and not having a certificated take-off rating of more than 1,350 horsepower.* Engines of not more than 1,830 cubic inches displacement and not having a certificated take-off rating of more than 1,350 horsepower which necessitate a major modification of redesign of the engine installation may be installed, if the engine fire prevention and fire protection are equivalent to that on the prior engine installation.

(d) *Installation of engines of more than 1,830 cubic inches displacement or having certificated take-off rating of more than 1,350 horsepower.*

¹It is not intended to waive compliance with such airworthiness requirements as are included in the operating parts of the Civil Air Regulations for specific types of operation.

§ 25.1

Engines of more than 1,830 cubic inches displacement or having certificated take-off rating of more than 1,350 horsepower may be installed if compliance is shown with the engine installation requirements of Part 4b: *Provided*, That where literal compliance with the engine installation requirements of Part 4b is extremely difficult to accomplish and would not contribute materially to the objective sought, and the Administrator finds that the experience with the DC-3 or L-18 airplanes justifies it, he is authorized to accept such measures of compliance as he finds will effectively accomplish the basic objective.

4. *Establishment of new maximum certificated weights.* An applicant for approval of new maximum certificated weights shall apply for an amendment of the airworthiness certificate of the airplane and shall show that the weights sought have been established, and the appropriate manual material obtained, as provided in this section.

NOTE: Transport category performance requirements result in the establishment of maximum certificated weights for various altitudes.

(a) *Weights—25,200 to 26,900 for the DC-3 and 18,500 to 19,500 for the L-18.* New maximum certificated weights of more than 25,200 but not more than 26,900 pounds for DC-3 and more than 18,500 but not more than 19,500 pounds for L-18 airplanes may be established in accordance with the transport category performance requirements of either Part 4a or Part 4b, if the airplane at the new maximum weights can meet the structural requirements of the elected part.

(b) *Weights of more than 26,900 for the DC-3 and 19,500 for the L-18.* New maximum certificated weights of more than 26,900 pounds for DC-3 and 19,500 pounds for L-18 airplanes shall be established in accordance with the structural performance, flight characteristics, and ground handling requirements of Part 4b: *Provided*, That where literal compliance with the structural requirements of Part 4b is extremely difficult to accomplish and would not contribute materially to the objective sought, and the Administrator finds that the experience with the DC-3 or L-18 airplanes justifies it, he is authorized to accept such measures of compliance as he finds will effectively accomplish the basic objective.

(c) *Airplane flight manual-performance operating information.* An approved airplane flight manual shall be provided for each DC-3 and L-18 airplane which has had new maximum certificated weights established under this section. The airplane flight manual shall contain the applicable performance information prescribed in that part of the regulations under which the new certificated weights were established and such additional information as may be necessary to enable the application of the take-off, en route, and

14 CFR Ch. I (1-1-08 Edition)

landing limitations prescribed for transport category airplanes in the operating parts of the Civil Air Regulations.

(d) *Performance operating limitations.* Each airplane for which new maximum certificated weights are established in accordance with paragraphs (a) or (b) of this section shall be considered a transport category airplane for the purpose of complying with the performance operating limitations applicable to the operations in which it is utilized.

5. *Reference.* Unless otherwise provided, all references in this regulation to Part 4a and Part 4b are those parts of the Civil Air Regulations in effect on September 1, 1953.

This regulation supersedes Special Civil Air Regulation SR-398 and shall remain effective until superseded or rescinded by the Board.

[19 FR 5039, Aug. 11, 1954. Redesignated at 29 FR 19099, Dec. 30, 1964]

Subpart A—General

§ 25.1 Applicability.

(a) This part prescribes airworthiness standards for the issue of type certificates, and changes to those certificates, for transport category airplanes.

(b) Each person who applies under Part 21 for such a certificate or change must show compliance with the applicable requirements in this part.

§ 25.2 Special retroactive requirements.

The following special retroactive requirements are applicable to an airplane for which the regulations referenced in the type certificate predate the sections specified below—

(a) Irrespective of the date of application, each applicant for a supplemental type certificate (or an amendment to a type certificate) involving an increase in passenger seating capacity to a total greater than that for which the airplane has been type certificated must show that the airplane concerned meets the requirements of:

(1) Sections 25.721(d), 25.783(g), 25.785(c), 25.803(c)(2) through (9), 25.803(d) and (e), 25.807 (a), (c), and (d), 25.809 (f) and (h), 25.811, 25.812, 25.813 (a), (b), and (c), 25.815, 25.817, 25.853 (a) and (b), 25.855(a), 25.993(f), and 25.1359(c) in effect on October 24, 1967, and

(2) Sections 25.803(b) and 25.803(c)(1) in effect on April 23, 1969.

(b) Irrespective of the date of application, each applicant for a supplemental